

CFES STEM Program: STEM Readiness

Introduction

Below are strategies intended for adults to help students become STEM ready. For activities that support the implementation of these strategies, reference the following chart: Suggested Activities.

- **Start young:** One of the hurdles that STEM educators face is trying to engage older students about STEM for the first time. It's never too early to start STEM education. Kids need to get excited about science early to inject imagination and creativity into the learning process (STEM Education, 2017). In northern New York, the CFES healthcare program (Box 9.1) involves students in grades 6-12 sharing STEM knowledge with elementary school youth as peer mentors. CFES helps students as young as Kindergarten to approach STEM through our core practices.
- **Find partners:** Chapter 5 discusses the value of and strategy for finding higher education partners, while Chapter 6 explores the business partner terrain. Keeping up with the rapid evolution of STEM-related jobs is difficult for rural educators, but partners can make this happen. Partnerships help connect the dots between STEM courses and STEM professions (Cohen, et al., 2013). Utilizing hospitals as partners allows students exposure to careers in medical fields that they may not be aware of and how these careers support overall patient care. Students can talk with experts about STEM careers and STEM study. Partners can provide students STEM career exposure through job shadowing and internships; support curriculum development; and provide professional development for teachers.
- **Find a Mentor:** Lack of awareness is problematic for the general student population and especially so for rural students. They need to see STEM workers and scientists like Sierra White as real people. As Coach Bill Beaney says, "You can't be what you can't see." Through mentoring interactions, CFES exposes students to STEM role models including local professionals.
- **Encourage STEM study:** Push students to take math and science courses in high school. Math and science coursework in high school is a key driver in establishing desire for continued learning in STEM disciplines (Crain & Webber, 2020).
- **Make STEM interesting:** Activities including mentoring, project-based learning, college STEM tours, meeting STEM professionals, and other opportunities help reinforce STEM pathways by providing ongoing exposure. Infusing STEM into other areas of learning helps to build student interest and awareness. STEM activities can be incorporated into the CFES core practices (Mentoring, Essential Skills, and Pathways to College and Career) to help students build interest and awareness. Box 9.1 shares activities and strategies to engage students in STEM.

- **Harness the Essential Skills:** Sierra White talked about the importance of setting goals and the value of other Essential Skills like perseverance and agility. CFES helps students leverage Essential Skills to achieve STEM readiness through resources like the STEM Scholar Map (Box 9.2), and through student-led service projects (Box 9.1).

CFES STEM Program: Suggested Activities by Grade Level

The following chart gives a sampling of the types of activities students can engage in to become STEM ready at different grade levels.

GRADE LEVEL	Suggested Activities
All grades	<ul style="list-style-type: none"> ● All Mentoring activities are school- based. ● <i>Mentoring programs engage multiple mentors with ties to STEM: teachers and staff, community members, college students, and older peers studying STEM.</i> ● <i>Mentors/mentees consistently engage in Essential Skills and Pathways to College & Career activities together.</i> ● <i>Participate in ongoing Essential Skill development through interactions with local STEM professionals, college students, older STEM Scholars, and CFES professional staff.</i> ● <i>Engage in at least two student- driven STEM-related service activities each year to apply Essential Skills to real life experiences.</i> ● <i>Through School-College and School- Business Partnerships, students:</i> <ul style="list-style-type: none"> ○ <i>Participate in college visits.</i> ○ <i>Meet STEM professionals.</i>
K-2	<ul style="list-style-type: none"> ● Pick a STEM-inspired book to read with your reading buddy ● Draw a STEM professional at work, ask your peers to guess the job ● Engage in STEM learning activities that promote curiosity and problem solving ● Identify a person in your network with a STEM job ● Hear from STEM guest speakers (college student or professional) about their job and education ● Attend a science fair hosted by upper grades to see STEM in action
3-5	<ul style="list-style-type: none"> ● Take a guided virtual tour of a college's STEM facilities ● Watch videos about different STEM professions ● Talk about the skills needed to work in different STEM fields (teamwork, agility, etc.) ● Work on a team to complete a STEM activity (science experiment, coding project) ● Get a book from the library on STEM experiments for kids; ask your mentor to do one of the activities with you ● Guide younger mentees on a nature walk around the school, helping them identify different plants and bugs



College + Career Readiness Resources

6-8	<ul style="list-style-type: none"> • Interview a STEM professional about what they do – share the information with peers (through school news, or other means) • Research a famous STEM role model, create a presentation for younger peers on why they inspire you • Tutor elementary students in math/science to prepare them for middle school • Lead a team of peers to create an activity book that teaches STEM concepts to younger students • Plan and participate in a service project focusing on the environment (e.g., beach cleanup, recycling program, community garden) • Teach senior citizens how to use technology • Research STEM colleges and careers • Participate in STEM-specific scavenger hunt on a college campus • Attend a STEM class specifically designed for middle school students while on a college visit • Complete the CFES STEM Scholar Map
9-12	<ul style="list-style-type: none"> • Interview a STEM professional about what they do – share the information with peers (through school news, or other means) • Develop and teach STEM lessons/activities to younger students. • Facilitate completing the CFES STEM Scholar Map for a group of younger students. • Tutor middle school students in math/science • Read a children's book with a STEM protagonist to an elementary classroom • Identify a STEM-related problem affecting your school/community, and share strategies to overcome this problem with community leaders • Identify local flora/fauna and create an interactive tour for younger students, visitors, and/or community groups • Organize a technology fair for your school community • Participate in an engineering project on a college campus and identify the Essential Skills that you used • Organize a math/science competition for middle school students • Attend STEM-specific summer opportunities at area colleges • Research STEM-specific scholarship opportunities • Participate in a STEM class and/or lab during a college visit • Take part in internships and job shadowing with STEM professionals • Use the Brilliant Career Lab website to identify careers in STEM and learn about the degree requirements for those pathways